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ABSTRACT

Struggles over educational access to new communications technologies in the age of U.S. radio and television provide insights into current struggles of educational access to the "information superhighway." Findings from an historical analysis of these earlier periods show that educational access to new communications technologies is often constrained or marginalized in four primary ways: (1) definitional distinctions in law and policy; (2) high costs and technical operating standards; (3) technical ghettoization in low-power, low-reach technologies, and (4) mid-stream legal and policy modifications including challenges to regulatory jurisdiction. Similar methods of constraint are identified in the current context of universal service e-rate discounts for K-12 access to the National Information Infrastructure (NII). It is suggested that educators should be excited about NII service discounts, but wary of regulatory constraints. (Contains 20 references.) (Author/AEF)

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History, Policy, and Universal Service: Does the Educational Radio and Television Experience Foreshadow What is To Come?

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Abstract: Struggles over educational access to new communications technologies in the age of US radio and television provide insights into current struggles of educational access to the "information superhighway". Findings from an historical analysis of these earlier periods show that educational access to new communications technologies is often constrained or marginalized in 4 primary ways: 1) definitional distinctions in law and policy, 2) high costs and technical operating standards, 3) technical ghettoization in low-power, low-reach technologies, and 4) mid-stream legal and policy modifications including challenges to regulatory jurisdiction. Similar methods of constraint are identified in the current context of universal service e-rate discounts for K-12 access to the NII. It is suggested that educators should be excited about NII service discounts, but wary of regulatory constraints.

Introduction[1]

The information age is upon us and the Clinton Administration's 1993 policy mandate to connect all schools to the National Information Infrastructure (NII) by the year 2000 has placed the education community at center (Information Infrastructure Task Force 1993). Such connections are not only necessary for educational delivery and achievement, it is claimed, but also for building a publicly accessible advanced telecommunications network for the nation. The *Telecommunications Act of 1996* is the legislation recently enacted to usher in the promise of this new age. Its universal service "e- rate" provisions establish discounts and encourage public/private partnerships so that K-12 schools, public libraries, and rural health care systems across the nation can defray the costs of accessing advanced telecommunications services.

But should educators trust the promise of the universal service e-rate as a way to ensure their access to the NII? There can be no doubt that the NII's advanced telecommunications networks and information systems have much to offer our educational, local, national, and international communities. Likewise there is precedent in US communications history for tempering market forces by regulating for the public interest. If we consider the history of how radio and television were introduced and regulated for educational access and use, can we find insight into the current situation?

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[1] For the sake of space, I have not included references to legislation or regulatory decisions that can be found using the title and date references provided in the text.

In this paper, I report findings from an historical analysis of struggles between 1912 and March 1999 over terms and efforts to regulatorily ensure educational access to radio, television, and networked computer technologies. By submitting policy documents and related academic and popular articles to methods of textual analysis and genealogical discourse analysis (Foucault, 1984), I found that education is consistently constrained from being afforded secure and autonomous access when new communications technologies are introduced. Although access is supported rhetorically, financially, and regulatorily –both by government and the private sector – it is limited regulatorily through 1) definitional distinctions in law and policy, 2) high costs and technical operating standards, 3) technical marginalization in low-power, low-reach technologies, and 4) mid-stream legal and policy modifications including challenges to regulatory authority of the FCC.

I argue we are currently seeing these kinds of constraints in the case of universal service e-rate provisions. Thus, my analysis would seem to suggest that the education community should both embrace and be cautious about the promise of the NII. For while advanced communications networks offer possible solutions for problems relating to providing K-12 education to a highly diverse national population, as in the past, they also threaten to either impose significant economic and organizational hardship on schools and their communities, or saddle them with unusable or marginal technological capabilities and unfulfilled hopes.

Limiting Educational Access to Communications: The Case of Radio

New technologies create the need for new regulations. When radio was introduced, for example, US legislators felt it necessary to regulate it so that dedicated frequencies could be set-aside for defense uses. In the US's first communications regulation -- the *Communications Act of 1912* -- a system of licensure was established that allocated particular spectrum frequencies to particular licensees. These early laws and regulations were constitutive in education's marginalization in communications.

In the first place, the 1912 *Act*, defined licensees as "persons, companies, corporations", and successive amendments defined them as "individuals, firms, or corporations" (1927), and as "persons, corporations, and amateur stations" (1934). Nowhere did the language of these early laws deem public educational institutions viable licensees, unless tied to private or government research under the 1912 provision for "conducting experiments for the development of the science of radio communication"

Secondly, The 1927 *Communications Act* established costly licensing fees and required that stations operate with stronger signals, longer hours, facilities built to code, etc. In 1929, *General Order 40* re-allocated spectrum and placed educational stations in low-power, low-reach frequencies which, although they were more expensive to operate, were more difficult to receive. These legislative and technical decisions had a chilling effect on educational uses of new radio technologies. Without the deep pockets or the technical acumen of their commercial counterparts, educators were often unable to meet the new, significantly more taxing financial and technical commitments of the late 1920s. And, because their stations were low-power and low-reach, they had trouble developing markets. By the time the *Communications Act of 1934* was passed, reports like the following were not uncommon.

> Professor Jerome Davis of the Yale University Divinity School presented...the results achieved by the present radio law. When it went into effect there were ninety-four educational institutions engaged in broadcasting; today difficulties put in their way are so great that many, including Columbia University and the Massachusetts State Department of Education, have given up entirely, while many of the others are rendered almost useless by the policies of the government (The Nation 1934, p. 201).

Despite these developments, there was some financial and institutional support for educational broadcasting. For example, the Office of Education for established a Radio Section in 1929 to "initiate and assist with research studies of radio" for adult education (Saettler 1990, p.213). The Payne Fund ntinued its long-standing support of lobbying efforts to set-aside dedicated non-commercial channels by coalitions like the National Committee on Educational Radio (NCER) (McChesney 1993). President Roosevelt allocated $75,000 to the Office of Education in 1935 to develop educational programming (Arafeh 1998). And, radio corporations offered free air time for educational broadcasting as part of their "public interest" mandate (Studebaker 1936)[2].

While each of these efforts generously contributed to the cause of educational radio in their different ways, commercial stations had a particularly strong effect. Not only were their lobbies strong, their willingness to broadcast educational programming for free made it difficult to justify the more costly alternati of educators owning, making, and running their

[2] US Commissioner of Education J.W. Studebaker (1936), noted that "the commercial sale value of the [radio] time used by the Office of Education during the last six months has been estimated at several hundred thousand dollars. That is an impressive amount of money...And yet these [private radio] companies provide free time on the air to the Office of Education and to other educational and non-commercial organizations" (p.3).

own stations and shows.

By 1936, then, the question was more one of how education could contribute to commercial broadcasting's "public interest" mandate than how it could gain dedicated station access and programming control. This quote by Commissioner Studebaker from the 1936 National Conference on Educational Broadcasting is instructive, particularly in light of current efforts at public/private partnerships for advancing the NII:

> Suppose we state the problem this way: How can public enterprise use a utility which is privately controlled? Let me repeat that: How can public institutions (educational organizations) use the publicly owned airwaves which are controlled by private enterprises under federal licenses? Is this the basic question that confronts us? ... [T]o gain our objectives, educational broadcasting requires that we pool our knowledge of educational purposes and of planned instruction with the practical experience of broadcasters schooled in the technical complexities of radio. Let us – educators and broadcasters – go forward together (Studebaker 1936, pp. 4-5).

Educators and broadcasters did go forward – often together – but push-me/pull-you frequency set-asides and spectrum re-allocations kept educators off balance. The 25 AM channels reserved by the FCC for in-school educational use were later transferred to FM spectrum where limitations in bandwidth left only 5 low-power channels intact (Sterling and Kitross 1990). By the end of 1941, there were only 2 FM education-run stations which grew in 1945 to 6, and then to 90 in 1952. Frequency relocation to the 88-108MHz bandwidth, and changes in FCC guidelines that allowed education-run stations to broadcast with only 10 watts of power (5-10 mile reach) contributed to this upswing in educational radio stations. While the positive impact of these regulatory technical changes can be seen by the dramatic increase in stations between 1941 and 1952, educational aspirations were likewise limited by low-power stations and regulatory uncertainty. This is the fourth method of educational constraint to which I want to draw attention: 4) mid-stream modifications and revisions in policy, legislation, or administration that either frustrate or erode legitimate access and positive activity.

These four specific regulatory techniques helped marginalize the education community's radio use, often resulting in reliance on, and collaboration with, commercial enterprise. Federal and state governments were pleased with such arrangements because it relieved

them of funding and staffing a more robust educational radio sector. As well, the primary burden of communications infrastructure development was placed on private industry which benefited because it was assured control of the medium and income from government- and foundation-subsidized educational programming. The education community, however, was placed in a role of dependence. As the promise of television loomed on the horizon, little would change.

Limiting Educational Access to Communications: The Case of Educational Television

The mid-40s increase in educational radio channels was partly due to regulatory and technical modifications required by the advent of television in which education got a poor start. The War Production Board imposed a station construction freeze between 1942 and 1945, and the FCC a debilitating license freeze in 1948 that lasted 6 years. Education was unable to get its foot in the television door during these early boom years.

During 1950 and 1951 of this of this hiatus, the FCC held hearings to determine the new regulatory scheme for both radio and television channel assignments, as well as for color television standards and educational television set-asides (Saettler 1968). A combination of lobbying efforts by the Joint Council on Educational Television (JCET), research provided by the National Association of Educational Broadcasters (NAEB), and the active participation of FCC Commissioner Frieda Hennock did result in 242 channels (most in the UHF band) being set-aside in 1952 for the education community. Educational broadcasters were encouraged by this show of FCC support as well as the generous sponsorship for program development provided by the Ford Foundation's *Fund for the Advancement of Education* (TFAE) (Brinson 1998, DeVaney 1990, Saettler 1990).

As in the case of radio, however, channels were located in low-power UHF frequencies that were more expensive to operate and could not be picked up by all television receivers. Four years after UHF ETV channel WOSU broadcasting in Columbus Ohio, for example, 85% of the sets in its market were still unable to receive its signal (Baughman 1985). This devastated educational broadcasters who, now subject to more stringent ratings measurement schemes, were hard-pressed to justify station ownership and operation for such small markets. Even with the success of the 1952 channel reservations then, educational broadcasters once again faced structural barriers and technical marginalization that hindered their ability to provide consistent, wide-reaching, and receivable educational programming to

the schools and communities in their particular areas.

Educators' struggles for more favorable circumstances took a distinctly different turn in 1962 when Congress passed the *ETV Facilities Act*. Partly a response to an increasingly uncontrollable commercial sector, and partly an attempt to bolster the goals of Johnson's Great Society program, this Act initiated federal funding and regulatory support for *public* broadcasting[3]. As a result of the Act, ETV channels increased from 52 in 1961 to 114 in 1966 and then to 252 in 1972 (Sterling and Kitross 1990) – still in the low-power frequencies.

Between 1962 and 1967, educators sought programming from the Ford Foundation's National Educational Television Center (NET)[4] and settled in to one of the most robust, autonomous educational broadcasting moments in US history. Stations were in place, funding was available, and programming was on the rise. When the Johnson Administration's appointed Carnegie Commission's recommendations on extending the *ETV Facilities Act* were enacted in the *Public Broadcasting Act* in 1967, however, such halcyon days were over.

This Act not only passed control and funding of educational broadcasting to a publicly-funded but semi-private Corporation for Public Broadcasting (CPB), it also definitionally changed the educational broadcasting charge from one of either "educational" or "instructional" programming (i.e. ETV or ITV) to one of "public" programming. Within this definitional shift, ETV's instructional mission – which included distance initiatives up to this point – were excluded from public broadcasting's mission. "Public" broadcasting intoned broadly "cultural" programming. Once again, definitional requirements resulted in a marginalization that not only barred educators from being able to pursue what they had perceived to be their primary program content domain but, this time, also resulted in a loss of their stations to a semi-private government agency. This left the lower-power, lower-reach stations – particularly the closed-circuit, microwave-distributed Instructional Television Fixed Service (ITFS) systems –for instructional use. In the best cases, municipalities and

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[3] The Act also mandated that all television sets be manufactured with UHF and VHF reception capability.

[4] Originally the National Educational Television and Radio Center, which was founded in Ann Arbor, Michigan in 1954. A collective that developed educational programming, it changed its name in 1963 to the National Educational Television Center (NET) and received funding from the Ford Foundation (Sterling and Kitross 1990).

states have developed local and regional instructional networks from these facilities. However and again, here was another case where education was being definitionally and technically marginalized while simultaneously being kept off-balance by uncertainty in policy and legislative determinations.

Cable broadband technology produced a similar scenario. Early days of its regulation held educational promise as the FCC encouraged cable systems to provide "public access" (i.e. channels designated for autonomous public, educational, and government use) through an informal recommendation in 1969. In 1972, the FCC mandated that cable systems serving areas with 3500 or more subscribers provide PEG channels and educators found yet another opportunity to utilize new communications infrastructure for their curricular and pedagogical purposes (Engelman, 1990).

Unfortunately, the Supreme Court ruled that the FCC was not authorized to mandate PEG access in *FCC v. Midwest Video Corporation* in 1979. This, in combination with the *Cable Communications Policy Act of 1984's* statutory location of jurisdiction for negotiating PEG set-asides in municipalities, had two effects. First, it reduced the likelihood of establishing PEG channels and, second, it continued the trend of technical marginalization by virtue of PEG stations being available only to cable subscribers within a small geographically-bound system (Arafeh 1992). What the case of cable shows, however, is one more form of mid-stream modification to laws and regulation: annulment of regulatory determinations through formal challenges to the jurisdiction and authority of the regulating body – the FCC.

To date, schools and districts have had varying degrees of success using television for education. This is partly because they have had trouble gaining access to production equipment and facilities, partly because regulations continue to change, and partly because they do not have the financial and human resources. Some states and regions have been able to develop quite robust educational networks (i.e. Iowa, South Carolina, etc.). This outcome has been facilitated in more recent days by regulatory initiatives like the StarSchools program. It is safe to say, however, that educational broadcasting has, and continues to be, difficult for schools to undertake – especially elementary and secondary institutions.

Conclusion: Lessons from the Past and the Promise of Universal Service

Combining the informational and computational power of computers with the fast and wide-ranging distributive power of telecommunications networks presents an unprecedented

opportunity for commercial, interpersonal, and educational interaction. Or does it? Do these limited insights on the past help provide perspective on the present and future?

It would seem so, for while networked communications hold possibility for education, so did radio and television. Once again, K-12 access to new communications technologies is controversial, and the four regulatory constraints that I have outlined above remain hard at work.

The universal service e-rate program has been very successful in some respects. Over $1.4 billion dollars in discounts have been allocated to 94% of the schools that applied, and 54% and 48% increase respectively in schools and classrooms from 1994 to 1998 has been reported. At this rate, connecting all K-12 schools to the NII by the year 2000 may be an attainable goal, that already seems to be decreasing the positive correlation of school connection to the NII with race (Digital Beat, 1999).

The e-rate program is also being contested, however. The *Telecommunications Act of 1996* has deemed K-12 schools as having no legitimate interest in networked telecommunications other than as service end-users needing service discounts through an e-rate – a definitional distinction that supports the historical information provided above. And, as in previous communications scenarios, schools may be marginalized, or even ghettoized, by their less-than-state-of-the-art technology and, ostensibly, increasingly low-technology connections. Already there are password- and technically-driven "levels" to the Internet which distinguish commercial and government users from public and public institutional users like k-12 schools. Legislation like the *Next Generation Internet Research Act of 1998* and the *Technology Administration Act of 1998* are already trying to establish the I-NET, a value-added Internet, which again threatens to create and justify new technologies and capabilities outside of K-12 education's reach. Not every NII application is appropriate for elementary and secondary schools. Yet, as our conceptions of what these technologies can and should do are formed in early research, development, and implementation phases, educational and public aspirations should not necessarily take a back seat. As my research shows, limits to sophisticated technology has been particularly damaging for explorations of innovative ways education can contribute to uses of new communications and, in doing so, contribute to the public and national interest.

Lastly, there have been sufficient mid-stream modifications to e-rate legislation and its administration to keep educators off-balance and unable to plan for their futures.

Telecommunications service providers have filed suits claiming that the financial obligation is overly burdensome and that cost models are unreasonable (c.f. ALAWON 1999b). Industry has also chosen to "pass through" their universal service costs to customers', creating public stir and political anxiety (Atlanta Journal and Constitution 1998). Some federal legislators have challenged the FCC's authority to create a non-profit, quasi-public Schools and Libraries Corporation (SLC) to administer the funds (Simons 1998), as well as the FCC's authority to pursue social policy goals through its regulatory activities (Broadcasting and Cable 1999). These regulatory destabilizations have created a stunting period of uncertainty, chaos and, at times, paralysis as administrative jurisdiction continues to change and the FCC walks on egg-shells in order to keep legislators from dismantling it. Most recently, there has been proposed legislation to require that schools receiving e-rate discounts use filtering software[5], and that the e-rate program be "killed" altogether [6]. Such opposition to supporting educational access to networked communications will inevitably have devastating effects.

Does the educational radio and television experience foreshadow what is to come? This history suggests that this may well be the case as we see the universal service e-rate program – and the schools, students, and communities it is supposed to benefit –close to drowning through regulatory measures once again. There is the potential that this will be just another unhappy chapter in education's long history of attempting to benefit from, and positively use, communications technologies in the course of its work of educating the nation's children. However, it is my hope that the insights regarding K-12 education's marginalization relative to new communications technologies provided in this paper urges education advocates to keep their eyes on high-level policy, legislative, and regulatory activity – particularly when new technologies emerge. Only in this way will the educational community – and the public-at-large – gain assured, robust access to new communications technologies now, and in the future.

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[5] See Senator McCain (R-AZ) and Representative Frank's (R-NJ) various versions of a *Children's Internet Protection Act* (S97IH, HR896IH, and HR543IH), and Representatives Shows (D-MS) and Oxley's (R-OH) *Safe Schools Internet Act* (HR368 IH).

[6] See Representative Tancredo's *E-Rate Termination Act* (HR368IH).

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